



Overview of the NESC Passive Thermal Technical Discipline Team

Presented by:

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Thermal and Fluids Analysis Workshop

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Background

NASA Engineering and Safety Center's (NESC) mission is to perform value-added independent testing, analysis, and assessments of NASA's high-risk projects to ensure safety and mission success. The NESC engages proactively to help NASA avoid future problems.

NESC is an independently funded program with a dedicated team of technical experts that provides objective engineering and safety assessments of critical, high-risk projects.

NESC is dedicated to promoting safety through engineering excellence, unaffected and unbiased by the programs it is evaluating. The NESC is a resource and is meant to benefit the programs and organizations within the Agency, the Centers, and the people who work there.

Visit our website at: <http://www.nesc.nasa.gov>



Passive Thermal Technical Discipline Team (TDT)

Name	Center/Organization	Title/Position
Steve Rickman	LaRC (at JSC)	Passive Thermal Technical Fellow
Diane Sarrazin	ATK	Coordinator
Van C. Johansen	LaRC	Budget Analyst
Carolyn Carter Snare	ATK	Technical Writer
Steve Scotti	LaRC	Technical Expert
Ángel R. Álvarez-Hernández	JSC	Technical Expert
Robin Beck	ARC	Technical Expert
James Yuko	GRC	Technical Expert
Ruth Amundsen	LaRC	Technical Expert
John Sharp	MSFC	Technical Expert
Arturo Avila	JPL	Technical Expert
Charles "Dan" Butler	GSFC	Technical Expert
David Gilmore	The Aerospace Corp.	Technical Expert
Bruce Drolen	Boeing	Technical Expert

NESC is in negotiations for an additional external team member;
Goal is to have at least one TDT member from each center during next FY.



Scope of the Passive Thermal Technical Discipline Team (TDT)

Internal and external systems

Component passive thermal analysis

Vehicle on-orbit attitude timeline analysis

Integrated thermal analysis

Thermal control (heaters and controls, coatings, blankets and insulations, isolators, geometric design for view factors, materials emissivity/absorptivity properties)

Thermo-mechanical analysis for induced stress

Thermal model development and correlation

Thermal protection systems (reusable insulation as tiles, FRSI, and AFRSI blankets)

Hot Structure (thermal aspects)

Thermal seals and barriers

Ablative materials

Passive cooling of avionics components;

Purge, vent, and drain for vehicle cavities and compartments

Arc jet, radiant heat, and thermal-vacuum testing



Responsibilities

Participate as passive thermal control and thermal protection system experts in multi-discipline independent investigations and other activities;

Conduct passive thermal control and thermal protection systems **assessments**;

Critically reviewing passive thermal control and thermal protection systems-related technical input;

Act as a **technical resource** for the discipline;

With NESC Review Board approval, **develop approaches to identify, solve and prevent passive thermal control and thermal protection systems-related problems** throughout the Agency.



Stewardship of the Discipline

Conduct workshops and conferences to enhance discipline awareness;

Build and **maintain the health** of the Passive Thermal discipline;

Sponsor and support Agency-level standards and specifications, including core standards;

Lead NASA Discipline Working Groups;

Ensure **lessons learned** are identified and incorporated in processes;

Sponsor and conduct **advanced research** in the Passive Thermal discipline;

Foster NASA participation in **engineering academies**;

Lead activities promoting **stewardship of the Passive Thermal** discipline;

The TDT will be a **focal point for a Passive Thermal Community of Practice**.



Major Accomplishments From January 2009 to the Present

Established Technical Discipline Team;

Completed and/or participating in eight NESC-led technical assessments;

Developed and deployed the Passive Thermal Control and Protection Community-of-Practice web site (NASA Engineering Network);

Provided NESC technical penetration into Orbiter Damage Assessment Team activities during Shuttle missions;

Participated in Orion and Constellation design reviews;

Sponsored and completed five passive thermal control and protection discipline enhancing projects in FY 09 -- Initiated three new discipline enhancing activities in FY 10;

Co-sponsor of the Arc Jet Database Discipline Technical Assessment;

Lead co-sponsor of this Thermal and Fluids Analysis Workshop (TFAWS).

Passive Thermal Control and Protection Sample NEN Page

The link to the page, visible only inside the NASA firewall, is:

<http://nen.nasa.gov/portal/site/llis/community/PT/>

New NEN > Passive Thermal Control and Protection - Windows Internet Explorer

http://nen.nasa.gov/portal/site/llis/community/PT/

File Edit View Favorites Tools Help

New NEN > Passive Thermal Control and Protection

NASA TV | NASA Employment

NASA Engineering Network

NASA Engineering Network | NASA Domain | Lessons Learned | Employee Locator | Google

Search for Search

Welcome to New NEN

Communities by Technical Discipline > Passive Thermal Control and Protection

Passive Thermal Control and Protection

This page is dedicated to the memory of our colleague and friend, Glenn Tsuyuki.

Boundary Layer Transition height increase and addition noted for STS-134
 18-Jun-2010 **Boundary Layer Transition height increase and addition noted for STS-134**
 Source: NASA SpaceFlight.Com
 A Change Request (CR) has been put forward by the Shuttle Program to increase the height of the BLT DTO protuberance tile on Discovery for the STS-133 mission to one-half inches and perform a re-flight of the Catalytic Coating DTO on a TPS (Thermal Protection System) tile downstream of the BLT DTO tile. Read the full story on the Web.
 submitted by **Jim Angus** at Jet Propulsion Laboratory

- Carbon Nanotube Forests Connect Computer Chips to Heat Sinks
- Ceramic may coat future NASA spacecrafts
- FAA expedites windshield inspection order after cockpit fire
- Air Force seeks protection from scorching heat of hypersonic flight

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Community Links

- Best Practices**
Analysis Tools, Testing, Manufacturing, System Engineering, Much More
- Standards and References**
Passive Thermal Standards and References
- Conferences and Workshops**
Upcoming and Past Events for the Passive Thermal community
- Discussion Board**
Learn and contribute with other Passive Thermal members from around NASA.
- Document Library**
Lessons Learned, PT TDT, Best Practices, and much more
- Reading Room**
Find out what other PT members are reading. You can also suggest and recommend any material you find helpful.

Welcome to the Passive Thermal Community

Steve Rickman

Welcome to the Passive Thermal Control and Thermal Protection Community of Practice (CoP) portal. This web site was created as part of the NASA Engineering Network (NEN), a focused agency effort to promote collaboration and knowledge sharing among NASA's Passive Thermal Control and Thermal Protection community.

Initiated by the NESC Passive Thermal Technical Discipline Team (TDT), this portal was designed to provide maximum utility at your fingertips. Please take some time to familiarize yourself with the site's content. We hope that you'll find it useful in your work. It will grow over time as we continue to populate it and we welcome your inputs and suggestions to help it become a tool that will provide maximum benefit for the thermal community. Whether you are looking for a thermal test facility that meets your needs, links to key data, tutorials and reference documents, or to find out about an upcoming technical conference, it's our hope that this site will become your first stop.

Join the Thermalchat Mailing List
 Join the Thermalchat-gov Mailing List

Technical Fellow: Steve Rickman
Facilitator: Jim Angus

Disclaimer: The Passive Thermal Technical Discipline Team does not

Trusted sites 100%

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7:58 AM



Discipline Enhancing Projects

Completed FY 09 projects:

FIAT with Dynamic Surface Chemistry, ARC, (Frank Milos and Yih-Kanq Chen)

3dFIAT Enhancement, ARC, (Yih-Kanq Chen and Frank Milos)

Global Thermal Desktop Materials Database, LaRC, (Ruth Amundsen)

A Physics-Based Temperature Stabilization Criterion for Thermal Testing, JSC, (Steve Rickman and Eugene Ungar)

A Methodology for Ground-Testing of Microgravity Convection, LaRC, (Joe Gasbarre)

FY 2010 Projects Selected:

AeroTPS

TPSX Database

Thermal Margins White Paper



Leveraging the Success of TFAWS

TFAWS serves as a model for how to conduct a Community-of-Practice workshop;

Co-sponsorship across the NESC Passive Thermal (Rickman), Life Support/Active Thermal (Rotter), and Aerosciences (Schuster) technical disciplines:

Opportunity to reach out to colleagues in your discipline as well as related disciplines;

Some things you can do to build bridges:

- Meet some people you haven't met before -- exchange business cards;
- Learn about what they do;
- Take a short course in something you aren't normally exposed to;
- Attend a paper session for a topic you aren't familiar with;

We look forward to building a larger, more collaborative community.